Amendments to the Specification:

Please replace the original paragraphs identified below with the following amended paragraphs. In the amended paragraphs, inserted text is marked with underline, deleted text is marked with ~~strikethrough~~, and changes are identified by a vertical bar in the margin.

Please replace the paragraph at page 3, lines 4-5 (paragraph **[0008]** of the published application US2004/0139416) with the following:

Therefore, there is a need for an improved method and apparatus for synthesis of circuits.

Please replace the paragraph at page 12, line 10 through page 13, line 2 (paragraph **[0059]** of the published application), with the following:

Work in this area continued and in 1996 the earlier work was set on firm theoretical footing. *See* T. R. Shiple, "Formal Analysis of Synchronous Circuits," Ph.D. Thesis, University of California, Berkeley, 1996. It was shown that the class of circuits that *Malik's* procedure decides are combinational are precisely those that are well behaved electrically, according to the up-bounded inertial delay model. *See* J. A. Brzozowski and C.-J. H. Seger, Asynchronous Circuits, Springer-Verlag, 1995. Refinements were proposed ~~refinements~~ to *Malik's* algorithm and extended the concept to sequences of inputs, rather than single input vectors, making the model more permissive in the case of combinational logic embedded in sequential systems. *See* T. R. Shiple, V. Singhal, R. K. Brayton, and A. L. Sangiovnni-Vincentelli, "Analysis of Combinational Cycles in Sequential Circuits," IEEE Int'l Symp Circuits and Systems, Vol. 4, pp. 592 - 595, 1996; and T. R. Shiple, G. Berry and H. Touati, "Constructive Analysis of Cyclic Circuits," European Design and Test Conf., 1996.

Please replace the paragraph at page 19, line 14 through page 20, line 14 (paragraph [**0096**] of the published application), with the following:

As noted, in existing methodologies, a total ordering is enforced among the functions in the substitution phase in order to ensure that no cycles occur. This choice can influence the cost of the solution. For instance, with the ordering shown in Figure 10, substitution yields:

$$f_1 = g_1(a,b,c,) = a(b\bar{c} + \bar{b}c)$$
$$f_2 = g_2(a,b,f_1) = b\bar{f}_1 + a\bar{b}$$
$$f_3 = g_3(a,b,c,f_1) = a\bar{f}_1 + b\bar{c}$$

with a cost of 13, whereas the ordering shown in Figure 11 yields:

$$f_1 = \bar{b}cf_2 + b\bar{f}_2$$
$$f_2 = b(c + \bar{a}) + a\bar{b}$$
$$f_3 = a\bar{f}_1 + b\bar{c}$$

with cost 14. As noted. an ordering is limiting because functions near the top cannot be expressed in terms of very many others. As illustrated, removal of this restriction can lower the cost. For example, if we allow every function to be substituted into every other, the network can be expressed as:

$$f_1 = \bar{f}_2 b + \bar{f}_3 a$$
$$f_2 = \bar{f}_1 b + a\bar{b}$$
$$f_3 = \bar{f}_1 a + b\bar{c}$$

with a cost of only 12. This network is cyclic, and not combinational. This may be verified according to well known procedures. For example, note that when $a = 1$ and $b = 1$, then $f_1 = \bar{f}_2 + \bar{f}_3, f_2 = f_3 = \bar{f}_1$. Note that if the order of substitution is restricted to that shown in Figure 12, the network can be expressed as:

$$f_1 = a(\overline{f}_3 + b\overline{c})$$
$$f_2 = b\overline{f}_1 + a\overline{b}$$
$$f_3 = \overline{c}f_2 + ab$$

the network is combinational ~~an~~ and has a cost 12.